

**Remarks**

Remarks in the previously filed Amendment/Response for application 10/037,718 filed on March 10, 2009 include Remarks regarding the covering distances “[x, y]” in the presently pending claims. For example, some such Remarks are present on page 73 of the previously filed Amendment/Response.

The applicants hereby make the following further Remarks to help ensure the record is as clear as possible and to avoid limitations unnecessarily being read into the presently pending claims. As noted, for example, by the CAFC in the case of *Springs Window Fashions v. Novo Industries* (323 F.3d 989), an applicant is in the best position to clarify the record and, if necessary, to amend the record to correct an attorney error. Also as noted, for example, by the CAFC in *E.I. Du Pont De Nemours & Company v. Phillips* (849 F.2d 1430) “*Generally, particular limitations or embodiments appearing in the specification will not be read into the claims. .... Where a specification does not require a limitation, that limitation should not be read from the specification into the claims.*” Also as noted, for example, by the CAFC in *Brookhill-Wilk-1, LLC vs. Intuitive Surgical, Inc.* (334 F.3d 1294) and other cases: “*Advantages described in the body of the specification, if not included in the claims, are not per se limitations to the claimed invention.*”

**The present application contains numerous examples and Description text, in which the invention is described simply in terms of “N covered to within [x, y].”** For example see example embodiments on p. 29 lines 16-17, p. 32 lines 20 & 31, p. 34 lines 15 & 21-22, p. 36 line 39 to p. 37 line 1 and p. 37 lines 20-21. Similarly the PCT parent also contains numerous examples in which the invention is described simply in terms of “N covered to within [x, y].” For example see example embodiments in PCT/US99/04376 on p. 28 lines 7-9, p. 31 lines 13, 24 & 30-31, p. 33 lines 10 & 16-17, p. 35 lines 34-35 and p. 36 lines 15-16. Similarly priority Provisional application (60/076102) also contains numerous examples in which the invention is described simply in terms of “N covered to

*within [x, y]*" or "*N covered to within  $\delta$* " wherein  $\delta$  is a two-dimensional distance that is or can be denoted as [x, y]. See for example Prov. '102 p. 34 lines 13-15, p. 40 lines 18-20, lines 44-45, p. 43 lines 40-41, p. 47 lines 37-39, p. 56 lines 39-41, lines 45-46, p. 59 lines 47-49, p. 60 lines 3-4, p. 64 lines 5-11, p. 65 lines 7-10, p. 67 lines 2-5 and lines 8-13.

The above cited examples illustrate that it is possible to claim the invention simply in terms of "*N covered to within [x, y]*," without reading other limitations into the claims that are not literally included in the claims. Since the presently pending claims claim the invention simply in terms of N covered to within [x, y], limitations should not be read unnecessarily into the presently pending claims.

In particular the limitation "*wherein x is short enough that it is possible for polymorphisms within the chromosomal location distance x of each other to be in linkage disequilibrium*" should not be necessarily (or automatically) read into the claims unless it is literally included. In the Supplemental Amendment of January 26, 2005 for this application this limitation is included in some claims and is discussed (see pp. 3, 5 & 9). The addition of this limitation to claim(s) in the Supplemental Amendment of January 26, 2005, had the effect of removing embodiments from the claim(s) which do not definitely or more strongly achieve a described objective or advantage of the invention.

In the Supplemental Amendment of January 26, 2005 it was stated that the limitation is not a true limitation, because it did not change the scope of the claim(s). This statement is, however, not necessarily true from a technical patent law standpoint. The addition of this limitation to a claim(s) may or does change the scope of the claim(s). To repeat what was noted above, for example, by the CAFC in Brookhill-Wilk-1, LLC vs. Intuitive Surgical, Inc. (334 F 3d 1294) and other cases: "*Advantages described in the body of the specification, if not included in the claims, are not per se limitations to the claimed invention.*"

In addition, the applicants hereby offer the following further Remarks regarding

the addition of the limitation (*"wherein  $x$  is short enough that it is possible for polymorphisms within the chromosomal location distance  $x$  of each other to be in linkage disequilibrium"*) to some claims in the Supplemental Amendment of January 26, 2005. As noted above, many examples (from the present application, the PCT parent (PCT/US99/04376) and the Provisional priority application (60/076102) are cited that illustrate that it is possible to claim the invention simply in terms of *"N covered to within  $[x, y]$ ."*

In these examples, specific values of " $x$ " are given that are (in general) independent of species and population (in a few cases the species is specified to be "human"). This independence of specific values of the parameter " $x$ " (from species and population) in broader descriptions of the invention originates from the fact that specific values of the parameter " $x$ " (in broader descriptions of the invention) are based on extrapolation. This extrapolation is from specific values of separation distance of polymorphisms that are in linkage disequilibrium (LD) for specific human populations to species and populations generally (see for example p. 35 lines 18 to 32 and p. 75 lines 41-42 of Provisional priority application 60/076102).

These specific separation distances of polymorphisms in LD (such as 10 cM and about 12 cM on p. 75 lines 41-42 of application 60/076102) lead to specific values of " $x$ " that are less than or equal to about 12 cM.<sup>1</sup> Some examples of these specific values of " $x$ " are: about 10 to 12 cM, about 10 to 12 million bp, 1 million bp, 1 cM, 0.25 cM, and 250,000 bp, see for example, p. 35 lines 18 to 32 of application 60/076102, PCT/US99/04376 p. 26 lines 15-22 and the present

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<sup>1</sup> **See p. 36 of the Amendment/Response of March 10, 2009.** As is well known the degree of LD between polymorphisms generally decreases with increasing distance (or separation) between the polymorphisms. This quote, for example, is from U.S. Patent 5,945,522, Cohen (1997): *"The degree of disequilibrium dissipation depends on the recombination frequency, so the markers closest to the disease gene will tend to show higher levels of disequilibrium than those that are farther away (Jorde L B, 1995, Am. J. Hum. Genet. 56: 11-14)."* See column 13 lines 33-37 of Cohen (1997). This is the reason that smaller chromosomal location components of the covering distance are described as

application p. 27 lines 25-31. See also, the numerous examples and Description text cited above, in which the invention is described simply in terms of “*N covered to within [x, y].*” Thus limitations should not be read unnecessarily into each of the presently pending claims (including claims limited by population or species) unless literally present.

In all of the examples specific values of “x” cited in the paragraph above, x is less than or equal to about 12 cM. And each of these specific values of “x” (including, e.g., 1 million bp) meets the particular limitation that “*[wherein] x is short enough that it is possible for polymorphisms within the chromosomal location distance x of each other to be in linkage disequilibrium*” (that is in the Supplemental Amendment of January 26, 2005 for this application).

Finally, for the currently pending claims, “*x is less than or equal to 1 million base pairs*” (see the single independent claim, claim 91). Therefore the currently pending claims meet the particular limitation “*wherein x is short enough that it is possible for polymorphisms within the chromosomal location distance x of each other to be in linkage disequilibrium.*” This is true because in the presently pending claims x is less than or equal to 1 million base pairs, which is less than or equal to about 12 cM (or about 12 million base pairs). And about 12cM or about 12 million base pairs is an example of a value of x for which *x is short enough that it is possible for polymorphisms within the chromosomal location distance x of each other to be in linkage disequilibrium.*

In summary then, the applicants have made the present further Remarks to help ensure the record is as clear as possible and to avoid limitations unnecessarily being read into the presently pending claims. However, even if the applicants had not made the present further Remarks, the currently pending claims meet the particular limitation "*wherein  $x$  is short enough that it is possible for polymorphisms within the chromosomal location distance  $x$  of each other to be in linkage disequilibrium*" (that is in the Supplemental Amendment of January 26, 2005 for this application).

Respectfully submitted,

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July 3, 2009

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